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Program Structures and Algorithms (Fall 2021)

Assignment 3

Link to the assignment's repository - https://github.com/Phani56/INFO6205-Assignments

Tasks Performed

- Completed UF_HWQUPC implementation and successfully ran the unit tests.
- Completed HWQUPC_Solution implementation and tested for object count ranging from 1000 to 256000.
- Ran the test 10 times and recorded the pairs required for each time in an excel. Plotted the graph and deduced a relationship.

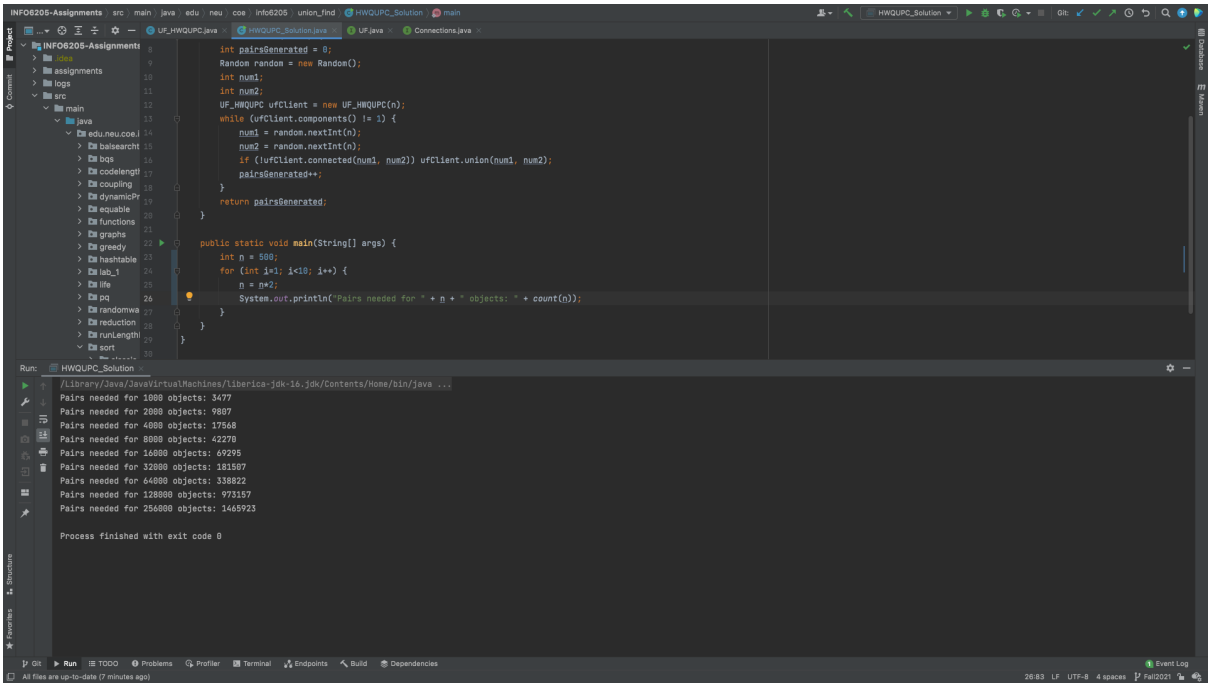
Link to data recorded and the graph plotted - UF_HWQUPC

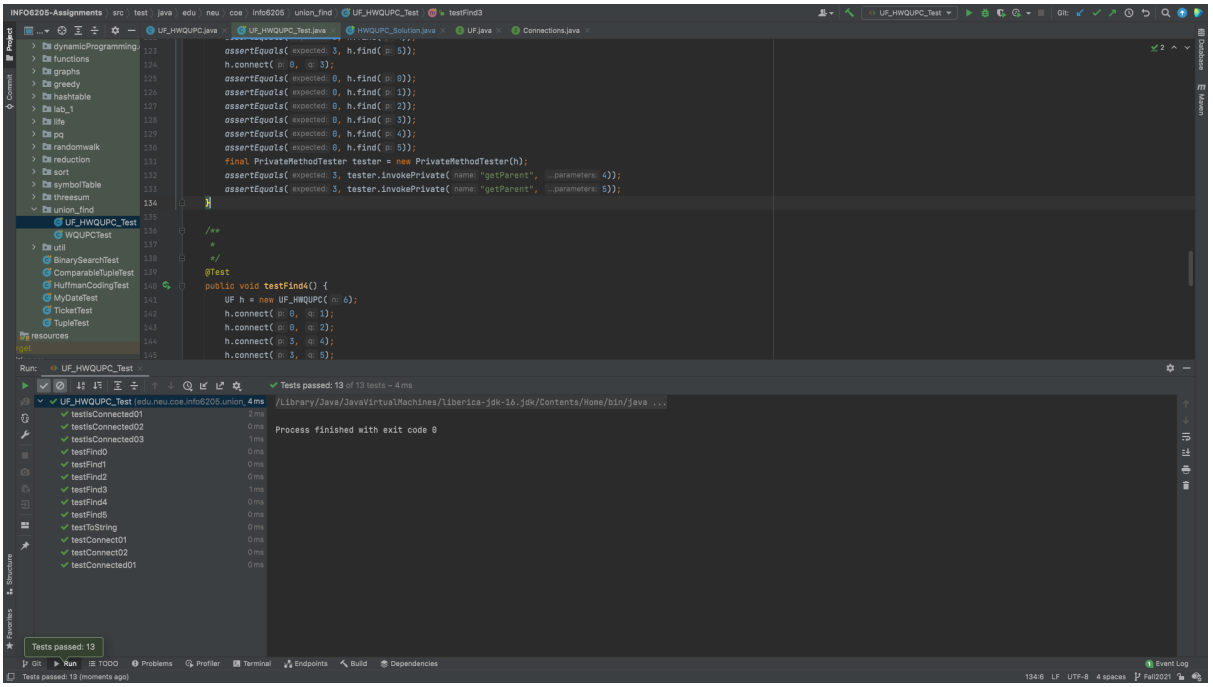
Relationship between N and M

N - number of objects, M - number of pairs generated. Based on the test runs, the graph and values. This is the relationship I have come up with

$$M = CNLog(N) \text{ where C = 0.35}$$

Screenshots of Run and test




INFO6205-Assignments
UF_HWQUPC_Test
testFind3
UF_HWQUPC.java
UF_HWQUPC_Test.java
HWQUPC_Solution.java
UF.java
Connections.java
dynamicProgramming
functions
graphs
greedy
hashtable
lab_1
life
pq
randomwalk
reduction
sort
symbolTable
threesum
union_find
UF_HWQUPC_Test
WQUPCTest
util
BinarySearchTest
ComparableTupleTest
HuffmanCodingTest
MyDateTest
TicketTest
TupleTest
resources
assertEquals(expected: 3, h.find(p: 5));
h.connect(p: 0, q: 3);
assertEquals(expected: 0, h.find(p: 0));
assertEquals(expected: 0, h.find(p: 1));
assertEquals(expected: 0, h.find(p: 2));
assertEquals(expected: 0, h.find(p: 3));
assertEquals(expected: 0, h.find(p: 4));
assertEquals(expected: 0, h.find(p: 5));
final PrivateMethodTester tester = new PrivateMethodTester(h);
assertEquals(expected: 3, tester.invokePrivate(name: "getParent", ...parameters: 4));
assertEquals(expected: 3, tester.invokePrivate(name: "getParent", ...parameters: 5));
}
/**
*
*/
@Test
public void testFind4() {
UF h = new UF_HWQUPC(n: 6);
h.connect(p: 0, q: 1);
h.connect(p: 0, q: 2);
h.connect(p: 3, q: 4);
h.connect(p: 3, q: 5);
Run:
UF_HWQUPC_Test
Tests passed: 13 of 13 tests – 4 ms
UF_HWQUPC_Test (edu.neu.coe.info6205.union_ 4 ms
testIsConnected01 2 ms
testIsConnected02 0 ms
testIsConnected03 1 ms
testFind0 0 ms
testFind1 0 ms
testFind2 0 ms
testFind3 1 ms
testFind4 0 ms
testFind5 0 ms
testToString 0 ms
testConnect01 0 ms
testConnect02 0 ms
testConnected01 0 ms
/Library/Java/JavaVirtualMachines/liberica-jdk-16.jdk/Contents/Home/bin/java ...
Process finished with exit code 0
Tests passed: 13
Git
Run
TODO
Problems
Profiler
Terminal
Endpoints
Build
Dependencies
Event Log
Tests passed: 13 (moments ago)
134:6 LF UTF-8 4 spaces Fall2021